

REMARKS

Entry of the foregoing, re-examination and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. § 1.111, and in light of the remarks which follow, are respectfully requested.

Claim 5 has been amended to further recite that the pillar ligands are arranged such that the length direction thereof is substantially perpendicular direction with respect to the organometallic layer. This amendment is supported by the specification, for example, page 5, lines 11 to 25 and Figures 2, 6 and 8A. In addition, claims 6, 8, 17 and 19 have been amended to further improve their clarity. No new matter has been added.

Upon entry of the Amendment, claims 1-41 will be all the claims pending in the application.

I. Affirmation of Election

Applicants affirm herein the election of Group I, claims 1-29 and 35-41, directed to an organometallic complex structure and a method of making.

Further, claims 30-34 include all the recitations of claim 1 and thus are eligible for rejoinder, pursuant to MPEP § 821.04. Applicants respectfully request that nonelected claims 30-34 be rejoined when the elected claims are allowed.

II. Drawings

Applicants note that the Office Action Summary is silent regarding the drawings (15 sheets) submitted with the application on September 15, 2006. The Examiner is respectfully requested to acknowledge acceptance of the drawings in the next PTO communication.

III. Response to Claim Objection

Claim 6 was objected to for allegedly informalities. Applicants respectfully submit that present claim 6 does not contain any informalities.

In the Amendment, claim 6 has been amended to replace "two another" with --two other--. Accordingly, the Examiner is respectfully requested to withdraw the objection.

IV. Response to Rejection under 35 U.S.C. § 112, Second Paragraph

Claims 6, 8, 17, 19 and 21 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Applicants respectfully submit that the claims as amended are not indefinite.

With respect to claim 6, in the Amendment, claim 5, from which claim 6 depends, has been amended to further recite that the pillar ligands are arranged such that the length direction thereof is substantially perpendicular direction with respect to the organometallic layer.

Further, claim 8 has been amended to replace "one" and "the other" with --first-- and --second--, respectively. Claim 17 has been amended to recite that the affinity of one of the organic compound and the pillar ligand is hydrophilic and the affinity of the other of the organic compound and the pillar ligand is hydrophobic. Claim 19 has been amended to replace "both" with --two--.

Regarding the terms "expanded" "contracted" and "transformed" recited in claim 21, these terms are used to describe that the pillar ligands may be stretched or distorted because they are made of soft molecules. See the description at page 40, lines 1 to 5, of the present specification.

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the § 112 rejection.

V Response to Rejections under 35 U.S.C. § 103(a)

a. Claims 1-6, 8-21, 23-29, 35, 36, 38 and 41 were rejected under 35 U.S.C. § 103 as allegedly obvious over Angew. Chem. Int. Ed., 1999, 38 by Kondo et al., in view of J. Phys. Chem. 1962, 66(6), 1070 by Millich et al.;

b. Claim 7 was rejected under 35 U.S.C. § 103 as allegedly obvious over Kondo et al. and Millich et al., and further in view of U.S. Patent No. 6,468,657 to Hou et al.;

c. Claim 22 was rejected under 35 U.S.C. § 103 as allegedly obvious over Kondo et al. and Millich et al., and further in view of U.S. Patent No. 5,149,513 to Takahama et al.;

d. Claim 37 was rejected under 35 U.S.C. § 103 as allegedly obvious over Kondo et al. and Millich et al. in view of J. Am. Chem. Soc. 2003, 125, 7814-7815 by Uemura et al.; and

e. Claims 39 and 40 were rejected under 35 U.S.C. § 103 as allegedly obvious over Kondo et al. and Millich et al., and further in view of U.S. Patent No. 4,818,898 to Anderson et al.

Applicants respectfully traverse the rejections for the following reasons.

Independent claim 1 recites an organometallic complex structure comprising: (1) a metal ion; (2) an organic compound capable of binding to the metal ion; (3) a pillar ligand capable of binding to the metal ion; and (4) an organic polymer capable of interacting with the metal ion, wherein the organometallic complex structure has a porous structure.

Independent claim 35 recites a method for producing an organometallic complex structure, comprising: mixing a metal ion, an organic compound capable of binding to the metal ion, a pillar ligand capable of binding to the metal ion, and an organic polymer capable of interacting with the metal ion.

The addition of an organic polymer capable of binding to the metal ion to the organometallic complex structure of the present application makes it possible to control the crystal growth to obtain an organometallic complex structure having a plate-like structure, which otherwise cannot be obtained without an organic polymer. Furthermore, Applicants believe that the presence of a slight amount of the organic polymer may effectively stabilize the specific and unique structure of the organometallic complex.

Kondo discloses a porous organometallic complex structure. The Examiner concedes that Kondo does not teach an organic polymer capable of binding to a metal ion.

Millich relates to coacervation induced by heavy metal ions. Coacervation is a phenomenon that a polymer colloid solution is separated into two liquid phases by an introduction of a third component, providing one phase rich in colloid, coacervate and the other phase as an equilibrium solution of the third component which caused the coacervation. As noted above, Kondo relates to an organometallic complex structure. Therefore, one of ordinary skill in the art would have had no apparent reason to modify the organometallic complex structure described in Kondo by adding an component used in coacervation process described in Millich. As such, there would be no motivation to combine Kondo and Millich as proposed in the Office Action.

Further, Hou is relied upon merely as teaching altering pore size of organic layers with exposure to certain conditions including steric bulk and polarity. Takahama is relied upon merely as teaching organic pillars expanding in the stimulus of a solvent. Uemura is relied upon merely as teaching mixing a metal ion with an organic compound in a ratio of 1:20. Anderson is relied upon merely as teaching applying pressure or molding crystals. None of these references provide the requisite reason to combine Kondo and Millich.

Moreover, none of the cited references disclose or suggest the above discussed effects achievable in the presently claimed invention.

In view of the foregoing, Applicants respectfully submit that the claims 1 and 35 are patentable over the cited references and thus the rejections should be withdrawn.

Additionally, claims 2-29 and 36-41 depend from claim 1 or 35 and thus are patentable over the cited references at least by virtue of their dependency.


VI. Conclusion

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at (202) 452-7932 at his earliest convenience.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

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By: 
Fang Liu, Ph.D.
Registration No. 51,283